A REVIEW OF THE AMERICAN SPECIES OF THE GENUS TEUTHIS.

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In the present paper is given the synonymy of the American species of *Teuthis* L. (= *Acanthurus* Forskål) with an analysis of their most important specific characters.

Specimens of each of three species, which seem to us valid, were obtained by Professor David S. Jordan, at Havana and at Key West. On this material, belonging to the Indiana University and the United States National Museum, the present paper is based. It is possible that other species exist in American waters, but there is certainly nothing in any published description which suggests the probability that such is the case.

We are indebted to Professor Jordan for use of his library and for valuable aid.

Analysis of American Species of Teuthis.

a. Outline rhomboid, the depth $1\frac{1}{2}$ in length to base of caudal; anterior profile subvertical, nearly straight, making an angle of about 60° with axis of body; color brown, washed with bright blue; body marked with undulating longitudinal light streaks; no dark crossbars; vertical fins with oblique bronze streaks; lips and caudal spine yellow; caudal deeply emarginate, its lobes about equal in length; middle rays about $\frac{3}{5}$ length of outer rays; head $3\frac{1}{4}$ in length to base of caudal. D. IX–27; A. III–24. *cæruleus.* 1

aa. Outline ovate; the depth 2 in length to base of caudal; anterior profile moderately convex, making angle of about 45° with axis of body.

b. Caudal deeply emarginate, its upper lobe longer than lower, slender and produced into a filament, the inner rays $\frac{3}{5}$ length of the outer rays (in the adult); margin of caudal fin whitish; color dark brown, no transverse bars; brown wavy longitudinal streaks on sides of body; eight dark lines running parallel with edge of dorsal fin for its whole length, and separated by interspaces of the same width; anal fin bluish, with a violet base; head $3\frac{1}{2}$ in length of body. D. IX–24; A. III–22. *tractus.* 2

bb. Caudal simply lunate, its inner rays about $\frac{2}{3}$ length outer rays; caudal lobes subequal, the upper never filamentous; color olive-brown, more or less distinctly greenish; middle of sides paler; sides with about twelve distinct blackish vertical bars, rather narrower than the interspaces, most distinct over front of anal; a brownish stripe along base of dorsal; spinous dorsal with alternate stripes running upward and backward, of dark blue and bronze olive, the two colors of about equal width; soft dorsal with a bluish streak on the anterior side of each ray, and a bronze stripe behind it; head $3\frac{1}{2}$ in length of body. D. IX–26; A. III–24. *hepatus.* 3.

1. **Teuthis cœruleus.**

Turdus rhomboidalis (The *Tang*), Catesby, Nat. Hist. Carolina, etc., ii, 1743, pl. 10, fig. 1 (Bahamas).

Teuthis fusca cæruleo nitens Brown, Jamaica, 1756, 454 (Jamaica).

Barbero Parra, Descr. Dif. Piezas, Hist. Nat., 1787, 45, Taf. 21, fig. 2 (Cuba).

Acanthurus cœruleus Bloch & Schneider, Systema Ichthyol., 1801, 214 (after Catesby, Parra & Brown); Cuvier & Valenciennes, Hist. Nat. Poiss., x, 1835, 179 (Martinique; Porto Rico; San Domingo); Günther, Cat. Fish. Brit. Mus., 1861, 336 (Caribbean Sea; West Indies; Bahia); Poey, Syn. Pisc. Cub., 1868, 355 (Cuba); Jordan & Gilbert, Syn. Fish. N. A., 1882, 617.

Acanthurus broussonnetii Desmarest, Prem. Dec. Ichthyol., 1823, 26, pl. 4, fig. 2 (Cuba).

Acanthurus brevis Poey, Memorias, ii, 1860, 207 (Cuba; young); Poey, Syn. Pisc. Cub., 1868, 355 (Cuba); Poey, Enum. Pisc. Cub., 1875, 66 (Cuba).

Acronurus cœruleatus Poey, Enum. Pisc. Cub., 1875, 69 (Cuba; larval form).

Acanthurus nigricans Goode, Bull. U. S. Nat. Mus., 1876, 41 (Bermudas) (probably not of Linnæus, a species of unknown origin, as yet unrecognized).

Habitat.—Atlantic shores of tropical America; Cuba; Key West; Martinique; Porto Rico; San Domingo; Bahia.

The synonymy and nomenclature of this beautiful species seem to be subject to no doubts of importance. It is rather less abundant at Key West or at Havana than either of the other species. One specimen corresponding to *A. brevis* Poey,

was taken at Key West. This is precisely like the adult, but shows very little blue.

The species called *Acronurus* are, as shown by Günther and Lütken, the young of *Teuthis*. The three species mentioned by Poey (*cœruleatus*, *nigriculus*, *carneus*) seem to be the young respectively of three species of *Acanthurus*. One of these, *Acronurus carneus*, was obtained by Prof. Jordan; we regard it as unquestionably the young of *Teuthis hepatus*.

2. Teuthis tractus.

Acanthurus tractus Poey, Memorias, ii, 1860, 208 (Cuba); Poey, Rept., 1866, 356 (Cuba); Poey, Syn. Pisc. Cub., 1868, 356 (Cuba); Poey, Anales Soc. Hist. Nat. Madrid, 1880, 246 (Cuba); Poey, Enum. Pisc. Cub., 1875, 67 (Cuba); Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 108 (Mazatlan; no description); Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 111 (Panama; no description); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 377 (Panama; no description); Jordan & Gilbert, Syn. Fish. N. A., 1882, 941.

Acronurus nigriculus Poey, Enum. Pisc. Cub., 1875, 69 (Cuba; larval form).

Acanthurus matoides Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 626 (Panama; no description; not of Cuvier & Valenciennes).

Habitat.—Coasts of tropical America; Cuba; Panama. Key West; Mazatlan; Panama.

This species may at all ages be known by the form of its caudal. Although in all species the caudal lobes grow longer with age, still very young specimens, as well as old of this species have the caudal more deeply furcate than any of *T. hepatus*.

There are also some color differences between the two.

The single species of *Teuthis* found on the Pacific coast of tropical America seems to be identical with *T. tractus*. It is close to *A. matoides* Cuvier & Valenciennes, but Prof. Jordan, who has examined the type of the latter in Paris, thinks it different.

3. Teuthis hepatus.

Hepatus mucrone reflexo utringue prope caudam Gronow, Zoophyl, No. 353.

Teuthis hepatus Linnæus, Syst. Nat., ed. 12, 1766, 507 (not as restricted by Cuvier & Valenciennes; is based principally on *Hepatus* of Gronow).

Acanthurus hepatus Bloch & Schneider, Systema Ichthyol., 1801, 211 (in part; not of Cuv. & Val. and later authors).

Chœodon chirurgus Bloch, Ausl. Fish., 1784, 99, sp. n. 24, taf. 208 (on a drawing by Plumier); Gmelin, Syst. Nat., 1789, 1259 (copied).

Acanthurus chirurgus Bloch & Schneider, Systema Ichth., 1801, 214 (copied); Cuvier & Valenciennes, Hist. Nat. Poiss., x, 1835, 168, (Martinique; Brazil; Cuba); Günther, Cat. Fish. B it. Mus., iii, 1861, 329 (Bahia; Puerto Cabello; Caribbean Sea; West Indies); Poey, Syn. Pisc. Cub., 1868, 355 (Cuba); Goode, Bull. U. S. Nat. Mus., 1876, 42 (Bermudas); Poey, Anal. Soc. Nat. Hist., Madrid, 1880, 245, pl. 6 (Cuba); Goode & Bean, Proc. U. S. Nat. Mus., 1882, 237 (name only); Jordan & Gilbert, Syn. Fish. N. A., 1882, 617.

Acanthurus phlebotomus Cuvier & Valenciennes, Hist. Nat. Poiss., x, 1835, 176 (Martinique; Brazil; Havana; New York); Dekay, New York Fauna Fish, 1842, 139, pl. 73, fig. 234 (copied); Poey, Repertorio, 1867, i, 256 (Cuba); Poey, Syn. Pisc. Cub., 1868, 245, fig. 7 (Cuba); Poey, Soc. Hist. Madrid, 1880, 245 (Cuba).

Acronurus fuscus Gronow, Cat. Fish., ed. Gray, 1858, 191.

Acanthurus nigricans Jordan & Gilbert, Syn. Fish. N. A., 1882, 941 (copied).

Habitat.— Atlantic Coast of America. Key West; Cuba; West Indies; Puerto Cabello; Martinique; Caribbean Sea; Brazil; Bahia.

This is the most abundant species of the genus, being apparently common throughout the West Indies, and certainly so at Cuba and Key West, and ranging northward occasionally on our South Atlantic Coast, perhaps as far as Charleston, but certainly not to New York, where it is reported on the authority of the confused collection of Milbert.

Two questions arise in the synonymy of this species; first, as to the identity of *phlebotomus* with *chirurgus;* second, as to the availability of the Linnæan name *hepatus* and *nigricans* for it. As to the first point, the description and figure of Cuvier and Valenciennes agree too well with our specimens for us to doubt their identity. Poey recognizes a species, *A. phlebotomus*, as distinct from *A. chirurgus* Poey, but on characters of slight importance and variable with age. The Linnæan name *nigricans* has been used both for this species and for *T. cæruleus.* The name is based on a description of Artedi, which has been considered by Cuvier and Valenciennes as probably belonging to an Asiatic species. The locality of the original specimen is uncertain, and the species cannot be positively made out. No American species should therefore be called *nigricans.*

The name *hepatus* has been used by Cuvier and Valenciennes

for an Asiatic species. The original *Teuthis hepatus* of Linnæus is based on various references, including *cæruleus*, *chirurgus* and the Asiatic species in question. The original type is, however, evidently the *Hepatus mucrone reflexo utrinque prope caudam* of Gronow, and part of the confusion has come from Gronow's attempt to identify with his specimen the Asiatic references of Valentyn and others. Gronow's specimen, however, is the type of his *Hepatus*, and consequently the proper type of *Teuthis hepatus* Linnæus. This same specimen, *Hepatus*, became the *Acronurus fuscus* of Gronow's Systema (Gray), and it is still in the British Museum. Günther identifies it with *Acanthurus chirurgus;* we do not, therefore, see how the substitution of *hepatus* for *chirurgus* is to be avoided, if the rules of nomenclature are strictly carried out. The same line of argument is used by Cuvier and Valenciennes, but they erroneously supposed Gronow's specimen to be an Asiatic fish.

Poey has referred the *Chætodon chirurgus* of Cuvier and Valenciennes to *Acanthurus tractus*, because of this expression in their description: "La caudale échancrée en croissant jusqu'au tiers peu près de sa longueur; ses lobes sont arguisés en pointe et le supérieur est plus long que l'inférieur." This does not indicate the *tractus*, which has the caudal still more deeply divided, and it is true of the average example of *T. hepatus*. *Acronurus carneus* seems to be the young of this species.